

~~CONFIDENTIAL~~

SURVEY (REVIEW OF REPORTS) OF
CRANBERRY ISLAND
HARBOR

MAINE

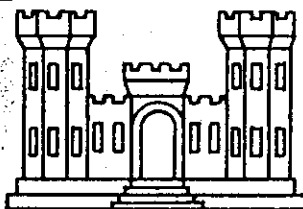
Nov. 1-14 - To C. & E.

15 - Dir. Eng.

16 - File

17 - Mr. Murphy

18 - Mr. Scott



AUTHORITY,-THIS REPORT IS
SUBMITTED IN COMPLIANCE
WITH RESOLUTION ADOPT-
ED AUGUST 19, 1939 BY THE
COMMITTEE ON RIVERS AND
HARBORS OF THE HOUSE OF
REPRESENTATIVES, UNITED
STATES CONGRESS

U. S. ENGINEER OFFICE
BOSTON, MASS.
JULY 12, 1940

SURVEY (REVIEW OF REPORTS) OF CRANBERRY ISLAND HARBOR, MAINE

Syllabus

The district engineer is of the opinion that, while the improvement desired at Cranberry Island Harbor, Maine, would produce many of the benefits claimed by local interests, such benefits would be too small in amount and too local in character to warrant the expenditure of Federal funds in the amount required to provide the desired improvement. He, therefore, recommends that no improvement of the locality be undertaken by the Federal Government at the present time.

War Department
U. S. Engineer Office
3d Floor, Park Square Bldg.
Boston, Massachusetts
July 12, 1940

Subject: Survey (Review of Reports) of Cranberry Island Harbor, Maine.

To: The Chief of Engineers, U. S. Army (Through the Division Engineer, North Atlantic Division, New York, N. Y.).

1. Authority. - This report is submitted in compliance with the following resolution, adopted August 19, 1939, by the Committee on Rivers and Harbors, House of Representatives, United States:

RESOLVED BY THE COMMITTEE ON RIVERS AND HARBORS OF THE HOUSE OF REPRESENTATIVES, UNITED STATES, That the Board of Engineers for Rivers and Harbors created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on Cranberry Island Harbor, Maine, submitted January 10, 1939, with a view to determining whether any improvement in the interest of navigation is advisable at this time.

2. Reports under review. - The reports under review are those submitted in compliance with authorization contained in the River and Harbor Act of August 30, 1935. Following the unfavorable preliminary examination report of the district engineer, a survey of the locality was ordered by the Chief of Engineers on March 12, 1937. In his report on survey,

transmitted to Congress on January 10, 1939, the Chief of Engineers expressed the view that dredging of the desired channel 3,500 feet long, 100 feet wide, and 6 feet deep, leading into the sheltered cove known as the "Pool", was not advisable at that time.

3. Description. - Cranberry Island Harbor lies between Great Cranberry and Little Cranberry Islands, members of a group of five small islands known as the Cranberry Isles, lying close to Mount Desert Island, off the coast of Maine. By water, it is 50 miles northeast of Rockland, 115 miles northeast of Portland, and about 13 miles south of Bar Harbor. Within a radius of less than 5 miles are Seal Harbor, Northeast Harbor, Southwest Harbor and Somes Sound.

4. The harbor is exposed to storms from the north and northwest, and particularly from the southeast, but is well sheltered from other directions by Little Cranberry and Great Cranberry Islands. Adjoining Cranberry Island Harbor on the southwest, and indenting the east side of Great Cranberry Island, is a partially enclosed shallow cove known as the "Pool", which offers excellent shelter from all quarters. At the entrance to this cove, however, is a shoal area which affords a depth of only about one foot at mean low water. Within the low water shore line the Pool has an area of 62 acres, only about 4 acres of which afford depths of 6 feet or more at mean low water. Large areas at the inner end and along the sides of the cove are exposed at low water and completely prevent access by boat to any of the wharves.

5. At Southwest Harbor, the nearest point to Cranberry Island Harbor for which tidal data are available, the mean and spring ranges of tide are 10.3 feet and 11.7 feet, respectively. No project for improvement of Cranberry Island Harbor has been authorized by Congress nor has any navigation improvement been made by local interests. No bridge crosses the harbor and questions of shore line changes, water power, flood control, or other special subjects would not be involved in the improvements considered in

this report. Prior reports on this locality consist only of the reports under review, described in paragraph 2. The locality is shown on United States Coast and Geodetic Survey Charts Nos. 306 and 1202, and on the map accompanying this report.

6. Tributary area. - The Cranberry Islands are adjacent to the summer colonies of the Mount Desert region which includes such well-known resorts and yachting centers as Bar Harbor and Northeast Harbor, and the villages of Seal Harbor, Otter Creek, and Pretty Marsh. Southwest Harbor, located about 4 miles northwesterly of Cranberry Island Harbor, is the commercial center of the locality and handles about 75 per cent of the commerce to and from the Cranberry Islands.

7. In 1930 the town of Cranberry Isles, which includes Great Cranberry, Little Cranberry, and Sutton Islands, had a population of 349 and estates valued at \$378,480. According to local interests, the summer population is 800 to 900. The principal commercial activity is lobstering and trawl fishing, in which 40 to 60 local residents are engaged. The catch of the local fishing fleet is landed principally at Southwest Harbor. The recreational business, including the storage, repair and painting of pleasure vessels, accounts for an important part of the income of local residents.

8. Terminal and transfer facilities. - There are 13 usable wharves of timber crib or pile construction within the Pool, all open to the public without charge, but none of these is accessible at mean low water. Three of these wharves have marine railway facilities with capacities ranging from 20 to 80 tons; gasoline and oil are sold at 2 wharves; none of the wharves is equipped with mechanical facilities for handling freight. About 75 per cent of the freight received on Great Cranberry Island is handled at the wharves in the Pool. In Spurling Cove, at the northwesterly end of Great Cranberry Island, is located the town landing, a timber and rock-filled crib pier where about 25 per cent of the freight landed on

the island is received. According to local interests, a depth of 2-1/2 feet at mean low water is available at the float which is connected to the town landing. Nearby is another small wharf used for the storage of fishing gear. The community of Islesford, on Little Cranberry Island, is served by 3 small wharves on the northeast side of Cranberry Island Harbor.

9. The existing wharves appear to be adequate in number to provide for the present and prospective needs of commerce on the islands. The chief disadvantages of the present wharves are due to location. Those in the Pool enjoy excellent shelter but are all located well above low water and are inaccessible, even by boats of moderate size, at stages lower than half tide. The wharves outside the Pool are accessible at lower stages, but are exposed to storms and to floating ice.

10. Improvement desired. - In order to afford local interests an opportunity to express their views with respect to the desired improvements, a public hearing was held at Great Cranberry Island, Maine, on October 31, 1939. The group present at the hearing consisted principally of local residents, including the town clerk, local fishermen, boat yard operators and others.

11. The improvement desired at the present time is the same as that considered in the reports under review; namely, a dredged channel 100 feet wide and 6 feet deep at mean low water, extending from Cranberry Island Harbor to the small, relatively deep portion of the Pool, a distance of approximately 3,500 feet. Several statements were made at the hearing suggesting that the width might possibly be reduced to 75 feet without reducing the effectiveness of the desired channel.

12. According to proponents, the Pool constitutes the only available anchorage area offering complete protection from storms, but its value as a harbor is largely nullified by the shallow entrance channel which affords a controlling depth of only about 1 foot at mean low water and prevents the passage of boats during a period extending from several hours

before to several hours after low water. To fishermen who use the Pool, this condition results in loss of fishing time, and hence loss of income; and, especially in winter, entails troublesome and uncomfortable delays waiting for sufficient tide to permit access to the Pool at night when returning from the fishing grounds. It is also claimed that local fishermen are frequently unable to get out of the Pool to reach boats carrying bait which the local fishermen must buy at times to carry on their fishing operations successfully.

13. Local interests expressed the belief that the desired improvement would not only benefit local fishermen by improving working conditions and permitting increased income from fishing activity, but would also enhance the value of the Pool as a base for pleasure boats and increase the business of the boat yards located on its shores.

14. No written statement was presented by local interests, nor were any of the information blanks, which were distributed with the notice of hearing, filled in and returned. Oral statements made at the hearing with respect to water-borne commerce contained a few estimates, but in general these were somewhat vague and conflicting. Annual receipts of gasoline were variously estimated at 28,000 to 100,000 gallons. It was stated that the number of boats assessed by the Town as of April 1, 1939, was 255, including about 100 locally-owned boats and 155 pleasure craft stored locally by summer residents. In describing the business done by the three local boat yards, the total number of boats stored was estimated as about 70. One of the local fishermen estimated that his average annual catch of lobsters and fish would total about 6,000 pounds and indicated that this figure would be representative of the annual catch of other local fishermen numbering 40 to 60. The town clerk agreed at the hearing to collect and submit all available commercial statistics at a later date. Several months after the hearing, local interests were requested by letter to furnish such data as might be readily available, but to date no information has been forthcoming.

15. No specific information relative to local cooperation was received at the hearing beyond a statement that any such action could be decided only by a vote of the residents of the town. The general attitude of those in attendance, however, indicated that no material contribution can be expected.

16. Commerce. - Commercial statistics applicable to Cranberry Island Harbor for recent years are not available. Statistics for 1935, prepared from information obtained locally, were presented in the report under review, and are repeated here to give a general view of the character and amount of local traffic.

Commerce for 1935

<u>Commodity</u>	<u>Amount</u>	<u>Estimated Value</u>
Gasoline	230 tons	\$ 15,000
Fuel oil	46 "	1,300
Fuel (wood)	200 cords	1,800
Fuel (coal)	450 tons	8,400
Cylinder oil	19 "	5,000
Annual import of salt	90 "	1,600
Annual catch of lobsters	230 "	96,400
Annual catch of fish	200 "	12,500
Store sales, general merchandise, and supplies		30,000
General freight	3,500 "	<u>75,000</u>
Total value of commerce		\$247,000

17. Statements made at the hearing would indicate that the present annual catch of fish and lobsters would total about 150 tons, or about one-third of the tonnage given above for 1935. Since most of the catch is landed at Southwest Harbor, even this amount cannot be credited to Cranberry Island Harbor as commerce. The item of 3,500 tons of general freight is equivalent to 10 tons per capita, on the basis of the permanent population, and since it excludes the bulk commodities such as coal, gasoline, etc., it appears to be far higher than the probable actual tonnage. It is believed that the present annual water-borne commerce in all commodities does not exceed 2,000 tons.

18. Vessel traffic. - According to an inventory taken by local officials, there were in the town, on April 1, 1939, 255 boats having an aggregate assessed valuation of \$65,210. Of these, approximately 100 were locally-owned and included the vessels in the local fishing fleet. The remaining 155 vessels, chiefly pleasure craft, were not locally owned but were in storage or under repair in the town at the time the inventory was made. The assessed valuation represents approximately one-third of the actual value of these boats.

19. There is little definite information available in regard to the lengths and drafts of these vessels. Statements made at the hearing indicate that the typical fishing boat is about 30 feet long and draws 3 feet. The majority of the pleasure boats apparently range from 20 to 45 feet in length and generally do not exceed 4 feet in draft. A few larger craft, ranging up to 8 feet in draft and 90 feet in length, have been stored in local boat yards.

20. Difficulties attending navigation. - The principal difficulty with which navigation must contend is the lack of sufficient depth in the channel leading to the Pool. The present controlling depth of about 1 foot at mean low water prevents the passage of vessels at low stages of the tide.

21. Survey. - A survey of the Pool and its entrance channel was made during the period October to December, 1937. The probings made during this survey indicated that dredging of the desired channel would involve the removal of mud, sand, clay, gravel, and possibly a few boulders. No additional field surveys were made in connection with the present report, and the improvements considered herein have been based on the 1937 survey. The accompanying map, entitled "Cranberry Island Harbor, Maine", in 1 sheet, scale 1:2400, File No. 674 D-11-1, shows the latest soundings, probings, and the general features of the area under consideration.

22. Plan of improvement. - In accordance with the present desires of local interests, the two plans of improvement considered in this report are identical with those covered by the report under review. These two plans are as follows:

Plan "A" -

An entrance channel 3,500 feet long, 100 feet wide, and 6 feet deep at mean low water, extending from the 6-foot depth in Cranberry Island Harbor to the 6-foot depth inside the Pool.

Plan "B" -

An entrance channel 3,500 feet long, 75 feet wide, and 6 feet deep at mean low water, extending from the 6-foot depth in Cranberry Island Harbor to the 6-foot depth inside the Pool.

23. The estimated quantities and costs involved in these two plans are given below. The quantities are expressed in terms of place measurement and are based on side slopes of 1 on 3 with an allowance of 1 foot for overdepth dredging. The unit costs include an allowance for engineering and contingencies, and are based on the assumption that all dredged material would be deposited in suitable disposal areas at sea.

Estimated Quantities and Costs

Plan "A" -

Dredging 61,000 c.y. @ 97¢	\$59,000
Estimated annual maintenance cost	2,500

Plan "B" -

Dredging 46,000 c.y. @ 97¢	45,000
Estimated annual maintenance cost	3,000

Note: The larger annual maintenance cost for Plan "B" is based on the assumption that a channel 75 feet wide would require more frequent maintenance at a higher unit price than that involved in maintenance of the wider channel in Plan "A".

24. Analysis of economic justification. - The economic cost of the project, expressed as an annual carrying charge and based on a life of 40 years, is given below.

<u>a. Federal investment:</u>	<u>Plan "A"</u>	<u>Plan "B"</u>
(1) Estimated cost of dredging	<u>\$59,000</u>	<u>\$45,000</u>
(2) Total Federal investment	<u>59,000</u>	<u>45,000</u>
<u>b. Federal annual carrying charges:</u>		
(1) Interest: 3-1/2% on item a(2)	2,065	1,575
(2) Amortization (40 yrs. @ 3-1/2%) item a(2)	698	532
(3) Estimated maintenance cost	<u>2,500</u>	<u>3,000</u>
(4) Total Federal carrying charge	<u>5,263</u>	<u>5,107</u>
<u>c. Non-Federal investment:</u>	<u>None</u>	<u>None</u>
<u>d. Non-Federal annual carrying charges:</u>	<u>None</u>	<u>None</u>
<u>e. Total annual carrying charges:</u>	<u>5,263</u>	<u>5,107</u>

25. Of the various benefits which local interests believe would result from the desired improvement, the only one which appears to involve a monetary return of material importance is the increase in fishing time which would be made possible by a channel affording passage to and from the Pool at all stages of tide. As indicated in paragraphs 26 to 31 below, it appears that the annual value of this particular benefit would not exceed \$3,000, an amount substantially less than the estimated annual carrying charges indicated above.

26. Discussion and conclusions. - The primary object of the desired improvement is free passage between the outer harbor and the sheltered waters of the Pool at all stages of tide. Under present conditions, the entrance channel has a controlling depth of about 1 foot at mean low water, and since the local fishing boats require a depth of 3 to 4 feet, there is a period, extending from about two hours before to two hours after low water, during which these boats are unable to

get in or out of the Pool. Any delay in reaching the fishing grounds reduces the effective fishing time and results in a corresponding reduction in the fishermen's income. Elimination of these delays can evidently be evaluated in monetary terms to represent the annual value of the principal benefit which local interests expect from the desired improvement.

27. In about 6 days in every 10, no delay would be caused under existing conditions. In the remaining 4 days, maximum delays, ranging up to 4 hours and averaging about 2 hours per day, would be involved in waiting for tides. Theoretically, this would be equivalent to the loss of one full fishing day in each 10, or about 10% of the potential fishing time. From a practical point of view, however, it appears that this delay could be materially reduced by varying the hour of departure from the Pool according to the time of tide. For example, it may be assumed that a boat would normally leave for the fishing grounds at 5:00 A.M. On a day in which low tide occurs at 6:50 A.M., departure 10 or 15 minutes before the usual hour would eliminate what would normally be a delay of about 4 hours. Thus it would seem entirely possible to reduce the total delays to a maximum of about 5% of the total potential fishing time.

28. The only definite statement made at the hearing with respect to the annual income of local fishermen indicated that the average annual catch, including lobsters and fish, is about 6,000 pounds per vessel. Assuming an average value of about 15¢ per pound, the average fishing income would be \$900 annually, or, for 50 fishermen, a total of \$45,000. An increase of 5% would correspond to an annual benefit of \$2,250.

29. Among other prospective benefits claimed by local interests are some which are indirect and intangible in character and others of questionable value. The loss of fishing income resulting from inability of land-locked fishermen to contact bait boats appears to be a

problem which could be solved by arranging for delivery of bait at the town landing or at Southwest Harbor at times of adverse tide. With Northeast Harbor, Southwest Harbor and Somes Sound available for cruising vessels seeking refuge, the value of the Pool as a harbor of refuge, with an area of but 4 acres of 6-foot depth, is of little importance to general navigation. The desired improvement, it is believed, would have little effect on the business of local boat yards or the expansion of the summer trade. The boat yards in the Pool are inaccessible at low stages of tide and their owners have no plans for providing the approach channels and deepened berths which would be required to make possible the best use of a deepened entrance channel. Extensive ledges along the shore of the Pool would make the construction of private landings too expensive to encourage the establishment of summer homes along the shore. There is no reason to expect that provision of a 6-foot channel into the Pool would result in reducing rates on commodities received on the island.

30. According to statements made at the hearing, there is no record of loss of life in this area chargeable to lack of access to the Pool. There has, however, been some loss of vessels and gear, which probably could have been avoided had the sheltered anchorage in the Pool been more readily accessible. Prevention of losses of this character, as well as elimination of some of the hardships now endured by local fishermen and others, would probably constitute benefits of moderate importance creditable to the desired project. Considering all items which can be regarded as reasonably prospective, it is believed that a fair value of the annual benefits of the improvement desired would be \$3,000.

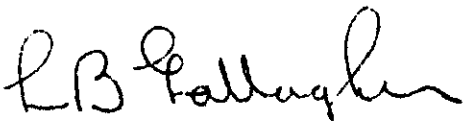
31. Virtually all of the probable benefits which may be expected to result from provision of the desired entrance channel are local in character. For this reason, the adoption of a Federal project would ordinarily involve a requirement that local interests bear a substantial

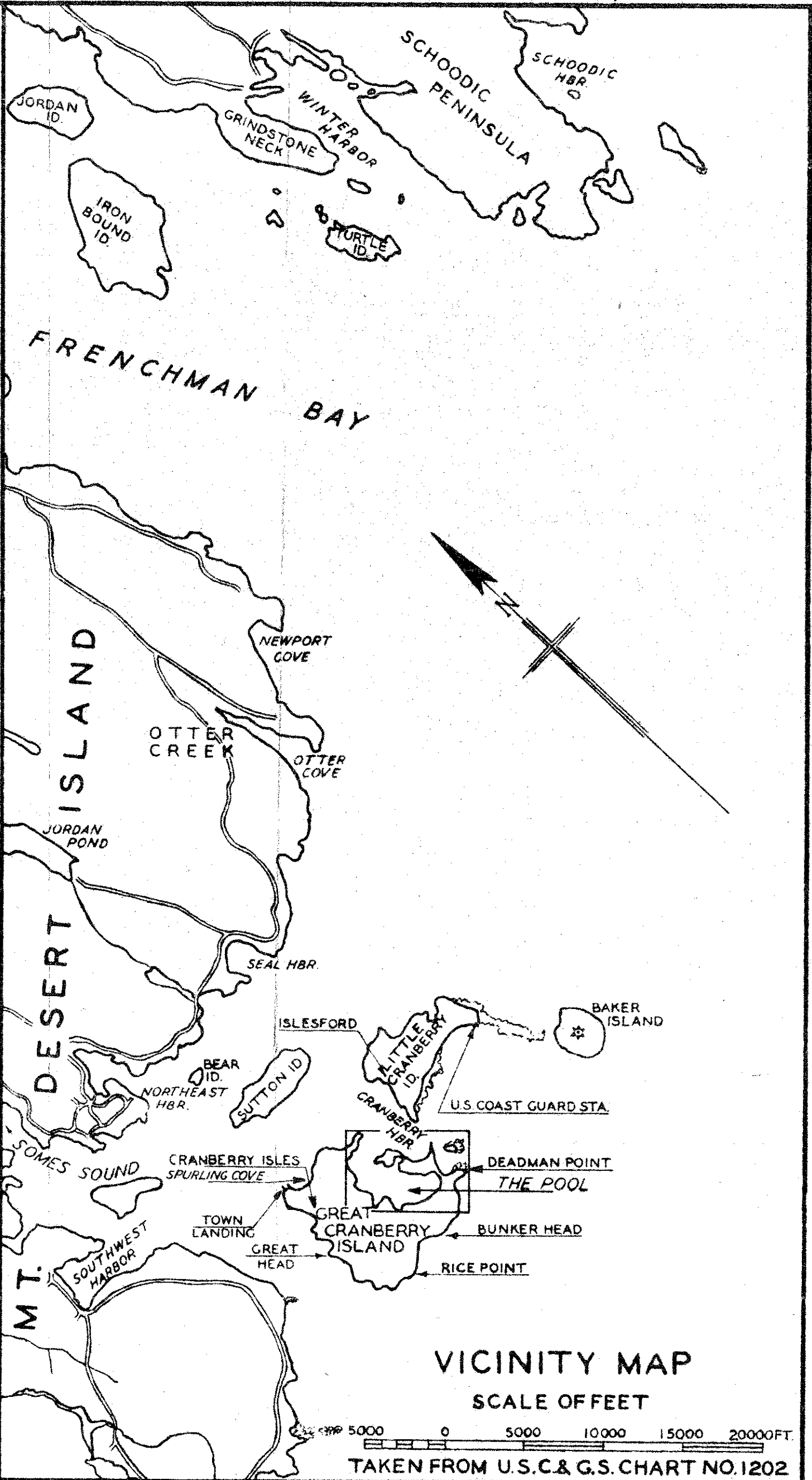
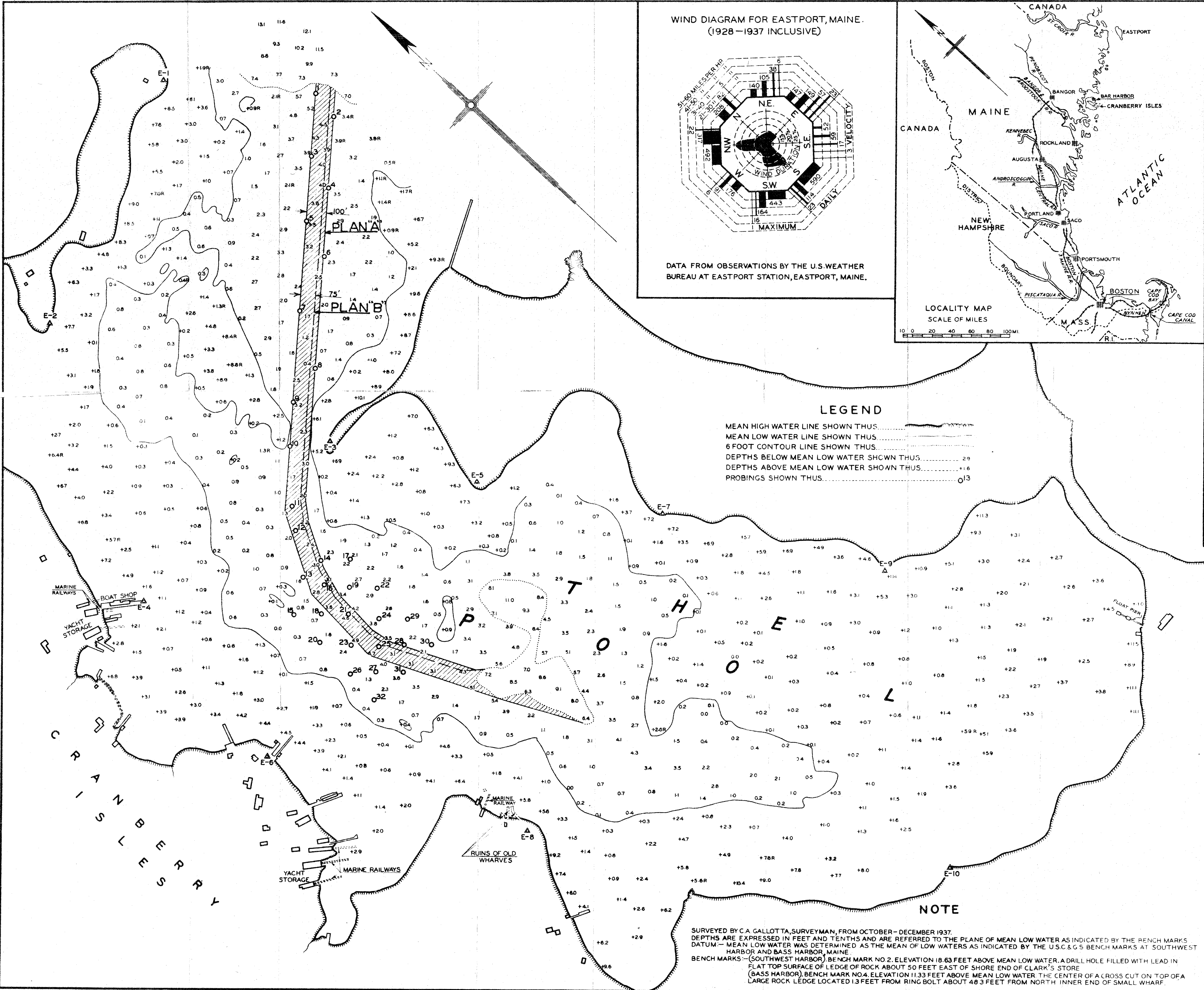
share of the cost. There is no likelihood that such a requirement would be met by the local interests who are concerned with the improvement of Cranberry Island Harbor. Entirely aside from the question of local cooperation, however, is the fact that the annual prospective benefits are less than the annual charges which would be involved in either of the improvements considered herein.

32. The district engineer is of the opinion that a dredged channel leading to the sheltered waters of the Pool would improve working conditions and tend to increase the income of local fishermen, as well as prevent the occasional loss of anchored vessels during severe storms. He concludes, however, that the benefits involved would be too small in amount and too local in character to warrant the expenditure of Federal funds in the amount required to provide the desired improvement.

33. Recommendation. - The district engineer recommends that no improvement of Cranberry Island Harbor be undertaken by the Federal Government at the present time.

Inclosure:
Map.


L. B. Gallagher
Major, Corps of Engineers
District Engineer



PROBINGS			
NO. OF PROBING	DEPTH IN FEET	PENE-TRATION	CHARACTER OF MATERIAL
1	5.0	7.3	SAND AND GRAVEL
2	4.0	7.6	" " " "
3	3.9	7.4	" " " "
4	3.9	7.9	SAND AND COARSE GRAVEL
5	3.3	7.3	" " " "
6	2.5	7.6	GRAVEL
7	1.8	7.3	" " " "
8	0.4	7.7	COARSE GRAVEL LIGHT CLAY
9	2.3	7.4	GRAVEL AND STONES
10	0.4	7.2	MUD, SAND AND GRAVEL TO CLAY
11	1.5	7.4	SAND AND GRAVEL TO CLAY
12	2.1	7.7	MUD, SAND AND GRAVEL TO CLAY
13	3.0	7.7	MUD AND SAND TO CLAY
14	2.6	7.8	" " " "
15	0.9	8.0	MUD AND SAND TO HARD BLUE CLAY
16	3.3	8.2	GRAVEL TO HARD CLAY
17	2.1	8.0	SAND AND GRAVEL TO CLAY
18	2.5	8.5	COARSE GRAVEL TO CLAY
19	3.0	7.9	SAND AND GRAVEL TO CLAY
20	0.4	8.6	SAND TO HARD CLAY
21	4.4	8.2	MUD, SAND AND GRAVEL TO CLAY
22	2.7	7.4	SAND AND GRAVEL TO CLAY
23	4.0	8.1	MUD AND GRAVEL TO CLAY
24	3.3	7.6	SAND AND GRAVEL TO CLAY
25	4.8	7.6	SAND AND GRAVEL
26	1.1	7.8	GRAVEL TO CLAY
27	3.3	8.8	MUD AND GRAVEL TO SAND (CLAY)
28	2.8	8.2	SAND AND GRAVEL TO CLAY
29	2.2	7.6	" " " "
30	0.9	7.5	MUD, SAND GRAVEL TO CLAY (BLDRS)
31	3.6	7.9	MUD, SAND AND GRAVEL TO CLAY
32	1.2	7.1	GRAVEL TO HARD CLAY

CRANBERRY ISLAND HARBOR, MAINE

IN 1 SHEET SCALE 1:2400

U.S. ENGINEER OFFICE, BOSTON, MASS., JULY 12, 1940.

SUBMITTED: *Charles S. Sullivan*
CAPTAIN, CORPS OF ENGINEERS

APPROVAL RECOMMENDED: *Robert C. Sullivan*
CAPTAIN, CORPS OF ENGINEERS

TO ACCOMPANY REPORT DATED JULY 12, 1940.

FILE NO. 674, D-11-1

16
47
Mr. Deane

Cranberry Isl. Har. 1/2.2

Subject: Survey (Review of
Reports) of Cran-
berry Island Harbor,
Maine.

1st Ind.

Office, Division Engineer, NORTH ATLANTIC DIVISION, New
York City, July 17, 1940 - To the Chief of Engi-
neers, U. S. Army.

I concur in the views and recommendation of the
District Engineer.

J. N. HODGES,
Colonel, Corps of Engineers,
Division Engineer.

Inclosures:

- 922 additional copies of District Report;
- 1/2.2a (tracing);
- 1/2.2b, in dup., each with list
(15 additional without list);
- 1/2.4a and b.

1/2.2a tracing under separate cover.
1/2.2b under separate cover.